

ASIX
Electronics Corporation

AX88172 USB 2.0 to Ethernet device driver installation guide

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Application Note (AN-05)

Abstract:

This document is the auxiliary document for user to set up SROM data and device driver in ASIX88172 USB to Ethernet chip.

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Serial EPPROM data installation

Device driver installation (WIN 2000, XP)

Serial EPPROM data installation

SEEPROM data store the descriptors for this device, all the data in this SROM is vital for the chip. Before install host device driver, user need make sure that EEPROM has been well define according to the rule describe below. Steps to setup the SEEPRM data as following.

1. Understand the reprehensive byte mean in the SROM.dat
2. Prepare SROM, please comfirm that 1st word of this SROM is not "0000"
3. Modify the SROM.dat according to Your System
 - Select either Remote Wake-up disable/enable mode
 - MAC address
 - Vendor ID, string name
4. Installation EEPROM
 - A. In LAB
 - Under pure DOS mode
 - Put the "WS.exe" and "SROM.dat" into same directory
 - C:\>WS
 - B. Factory mass-production
 - Prepare the following before running wsf.exe
 1. SROM.DAT ==> The standard SROM file.

2. CurEADDR.DAT ==> The current Ethernet Address will be written into adapter (6 byte :AA BB CC DD EE FF)
 3. MaxEADDR.DAT ==> The Maximum Ethernet Address will be written into adapter (6 byte :AA BB CC DD EE FF)
 4. CurSNUM.DAT ==> The current Serial Number will be written into adapter (4 byte: AABBCDD)
 5. MaxSNUM.DAT ==> The Maximum Serial Number will be written into adapter. (4 byte: AABBCDD)
- Put all program “WSF.exe” and all files into same directory
 - C:\> WSF

5 MKSRROM.exe

MKSROM.exe is a program for user to easier to generate SROM.dat. User may get this program by request from ASIX. Following is the step to use this program.

1. User should unzip the folder with files “mksrom.exe” and “srom.org”
2. Put these 2 files into same director. And run this program under pure DOS mode
3. Type MKSOM without any option will display the usage of this program
4. Type “MKSROM SROM.dat” to generate your own SROM.dat
5. Please key in the value according to your system.

```
C:\Mksrom>mksrom srom.dat
Make SROM Program v1.0
Input the Vendor ID (Heximal), ( ex. 0B95 ) : 0B95
Input the Product ID (Heximal), ( ex. 1720 ) : 1720
Input the Device Release Number (Heximal), ( ex. 0001 ) : 0001
Input the First PHY ID (Heximal),
  E0 ==> No First PHY, ( ex. 03 ) : 03
Input the Second PHY ID (Heximal),
  E0 ==> No Second PHY, ( ex. E0 ) : E0
Input the Manufacture Description String
  For Example : ASIX Electronics Corp. : ASIX Electronics Corp
Input the Product Description String
  For Example : AX88172 : AX88172
```



Note:

When The Manufacture Description String's length (M), and Product description string (P), include blank space Met Following equation: **(M or P+2)/8-8=0**, then this string is invalide. However, The MKSROM.exe will automatically padding a space if above equation is met.

4. Understand SROM.dat

	0	1	2	3	4	5	6	7
	8	9	A	B	C	D	E	F
0	15 00 60 22	CC 01 71 0C	20 12 77 06	29 27 3D 04	88 17 3D 04	20 05 3D 04	10 02 3D 04	09 04 1A 0C
1	EE 05 05 05	03 E0 50 50	08 10 30 30	40 12 38 38	49 27 31 37	FF FF 30 30	00 00 30 30	FF FF 30 32
2	12 01 03 01	00 02 09 02	02 00 27 00	00 40 01 01	95 0B 04 A0	20 17 96 09	01 00 04 00	01 02 00 03
3	00 00 02 00	00 07 07 05	07 05 83 02	81 03 00 02	08 00 00 FF	08 07 04 03	05 02 30 00	02 00 FF FF
4	12 01 03 01	00 02 09 02	02 00 27 00	00 08 01 01	95 0B 04 A0	20 17 96 09	01 00 04 00	01 02 00 03
5	00 00 00 00	00 07 07 05	07 05 83 02	81 03 40 00	10 00 00 DD	A0 07 FF FF	05 02 AA AA	02 40 BB BB
6	22 03 65 00	41 00 63 00	53 00 2E 00	49 00 20 00	58 00 43 00	20 00 6F 00	45 00 72 00	6C 00 70 00
7	2E 00 30 00	0C 03 31 00	41 00 FF FF	58 00 FF FF	31 00 FF FF	37 00 FF FF	32 00 FF FF	06 03 FF FF

AB CD
AB: Low byte
CD: High byte

EEPROM memory map

EEPROM OFFSET	HIGH BYTE	LOW BYTE
00H	RESERVED	WORD COUNT FOR PRELOAD
01H	*FLAG	
02H	HIGH-SPEED LENGTH OF DEVICE DESCRIPTOR (BYTE)	HIGH-SPEED EEPROM OFFSET OF DEVICE DESCRIPTOR
03H	HIGH-SPEED LENGTH OF CONFIGURATION DESCRIPTOR (BYTE)	HIGH-SPEED EEPROM OFFSET OF CONFIGURATION DESCRIPTOR
04H	NODE ID 1	NODE ID 0
05H	NODE ID 3	NODE ID 2
06H	NODE ID 5	NODE ID 4
07H	LANGUAGE ID HIGH BYTE	LANGUAGE ID LOW BYTE
08H	LENGTH OF STRING INDEX 1	EEPROM OFFSET OF STRING INDEX 1
09H	LENGTH OF STRING INDEX 2	EEPROM OFFSET OF STRING INDEX 2
0AH	LENGTH OF STRING INDEX 3	EEPROM OFFSET OF STRING INDEX 3
0BH	LENGTH OF STRING INDEX 4	EEPROM OFFSET OF STRING INDEX 4
0CH	LENGTH OF STRING INDEX 5	EEPROM OFFSET OF STRING INDEX 5
0DH	LENGTH OF STRING INDEX 6	EEPROM OFFSET OF STRING INDEX 6
0EH	LENGTH OF STRING INDEX 7	EEPROM OFFSET OF STRING INDEX 7
0FH	RESERVED	RESERVED
10H	MAX PACKETSIZE HIGH BYTE	MAX PACKET LOW BYTE
11H	***(PHY TYPE[7:5])(SECONDARY PHY ID[4:0])	***(PHY TYPE[7:5])(PRIMARY PHY ID[4:0])
12H	PAUSE PACKET HIGH WATER LEVEL	PAUSE PACKET LOW WATER LEVEL
13H	FULL-SPEED LENGTH OF DEVICE DESCRIPTOR (BYTE)	FULL-SPEED EEPROM OFFSET OF DEVICE DESCRIPTOR
14H	FULL-SPEED LENGTH OF CONFIGURATION DESCRIPTOR (BYTE)	FULL-SPEED EEPROM OFFSET OF CONFIGURATION DESCRIPTOR
15H-1FH	RESERVED	RESERVED

the **READ MARK** in each descriptor means user define area

0015: Preload word count. The preload data can refer to the EEPROM memory map

01CC: FLAG (0000000111001100).

Bit #	Description
0	Self Powered (for USB GetStatus) 1: self power; 0 : bus power
1	Reserved
2	Remote Wakeup support
3	Cover 0:normal 1: ignore one byte noise
4~5	Reserved
6	RX drop CRC Enable
7	TX append CRC enable
8	Capture Effective Mode
9~F	Reserved

20: HIGH-SPEED EEPROM OFFSET OF DEVICE DESCRIPTOR

12: HIGH-SPEED LENGTH OF DEVICE DESCRIPTOR (BYTE)

12 01 00 02 02 00 00 40 95 0B 20 17 01 00 01 02 03 01 (12h byte)

High-speed Device descriptor:

Offset	Description
12	bLength
01	bDescriptorType (DEVICE)
0200	bcdUSB
02	bDeviceClass
00	bDeviceSubclass
00	bDeviceProtocol
40	bMAXPacketSize0
0B95	IdVendor
1720	IdProduct
0100	bcdDevice
01	iManufacturer
02	iProduct
03	iSerialNumber
01	bNumConfiguration

29: HIGH-SPEED EEPROM OFFSET OF CONFIGURATION DESCRIPTOR

27: HIGH-SPEED LENGTH OF CONFIGURATION DESCRIPTOR (BYTE)

09 02 27 00 01 01 04 80 96 09 04 00 00 03 00 00 00 07 07 05 81 03 08 00 0B
07 05 02 02 00 02 00 07 05 83 02 00 02 00(27 byte)

Hi-speed Configuration descriptor:

Offset	Description
09	bLength
02	bDescription
0027	wTotalLength
01	bNumInterface
01	bConfigurationValue
04	bNumInterface
80	bConfiguraationValue
96	iConfiguration

Interface descriptor:

Offset	Description
09	bLength
04	bDescriptorType
00	bInterfaceNumber
00	bAlternatesetting
03	bNumEndpoints
00	bInterfaceClass
00	bInterfacesubclass
00	binterfaceProtocol
07	iInterface

Endpoint1 descriptor:

Offset	Description
07	bLength
05	bDescriptorType
81	bEndpointAddress
03	bmAttributes
0008	wMaxPacketSize
0B	bInterval

Endpoint2 descriptor:

Offset	Description
07	bLength
05	bDescriptorType
02	bEndpointAddress
02	bmAttributes
0040	wMaxPacketSize
00	bInterval

Endpoint3 descriptor:

Offset	Description
07	bLength
05	bDescriptorType
83	bEndpointAddress
02	bmAttributes
0002	wMaxPacketSize
00	bInterval

NID0: 88, NID1: 17, NID2: 20,NID3: 05,NID4: 10,NID5: 02:

MAC ADDRESS: 88 17 20 05 10 02

09 04: Language ID

- 60** (EEPROM OFFSET OF STRING INDEX1)
- 22** (LENGTH OF STRING INDEX 1)
- 71** (EEPROM OFFSET OF STRING INDEX2)
- 0C**(LENGTH OF STRING INDEX 2)
- 77** (EEPROM OFFSET OF STRING INDEX3)
- 06**(LENGTH OF STRING INDEX 3)
- 3D** (EEPROM OFFSET OF STRING INDEX4)
- 04**(LENGTH OF STRING INDEX 4)
- 3D** (EEPROM OFFSET OF STRING INDEX5)
- 04** (LENGTH OF STRING INDEX 5)
- 3D** (EEPROM OFFSET OF STRING INDEX6)
- 04** (LENGTH OF STRING INDEX 6)
- 3D** (EEPROM OFFSET OF STRING INDEX7)

- 04(LENGTH OF STRING INDEX 7)
- 1A (EEPROM OFFSET OF STRING INDEX8)
- 0C (LENGTH OF STRING INDEX 8)

- 05EE: MAX packet size
- E0: Secondary PHY ID
- 03: Primary PHY ID

- 10:Pause packet high water mark
- 08:Pause packet low water mark

- 40:FULL-SPEED LENGTH OF DEVICE DESCRIPTOR (BYTE)
 - 12: FULL-SPEED EEPROM OFFSET OF DEVICE DESCRIPTOR
- 12 01 00 02 02 00 00 08 95 0B 20 17 01 00 01 02 03 01(12 byte)

Full-speed Device descriptor:

Offset	Description
12	bLength
01	bDescriptorType (DEVICE)
0200	bcdUSB
02	bDeviceClass
00	bDeviceSubclass
00	bDeviceProtocol
08	bMAXPacketSize0
0B95	IdVendor
1720	IdProduct
0100	bcdDevice
01	iManufacturer
02	iProduct
03	ISerialNumber
01	bNumConfiguration

49: FULL-SPEED LENGTH OF CONFIGURATION DESCRIPTOR (BYTE)
 27: FULL-SPEED EEPROM OFFSET OF CONFIGURATION DESCRIPTOR
 09 02 27 00 01 01 04 80 96 09 04 00 00 03 00 00 00 07 07 05 81 03 10 00 A0
 07 05 02 02 40 00 00 07 05 83 02 40 00 00 (27 byte)

Full-speed Configuration descriptor:

Offset	Description
09	bLength
02	bDescription
0027	wTotalLength
01	bNumInterface
01	bConfigurationValue
04	bNumInterface
80	bConfiguraationValue
96	iConfiguration

Interface descriptor:

Offset	Description
09	bLength
04	bDescriptorType
00	bInterfaceNumber
00	bAlternatesetting
03	bNumEndpoints
00	bInterfaceClass
00	bInterfacesubclass
00	binterfaceProtocol
07	iInterface

Endpoint1 descriptor:

Offset	Description
07	bLength
05	bDescriptorType
81	bEndpointAddress
03	bmAttributes
0010	wMaxPacketSize
0A	bInterval

Endpoint2 descriptor:

Offset	Description
07	bLength
05	bDescriptorType
02	bEndpointAddress
02	bmAttributes
0040	wMaxPacketSize
00	bInterval

Endpoint1 descriptor:

Offset	Description
07	bLength
05	bDescriptorType
83	bEndpointAddress
02	bmAttributes
0004	wMaxPacketSize
00	bInterval

The rest byte is for either string or reserved byte. All string is according to Unicode code (URL: <http://www.unicode.com>)

Following is an example shown how to configure string descriptor, user may refer to USB2.0 Spec chapter 9 for detail information in string descriptor

1. In EEPROM memory map , 08h --> 60 22
60: Offset start at 60h
22: Length is 22h

2. Go to Offset 60h with Length 22h obtain

```
22 03 41 00 53 00 49 00 58 00 20 00 45 00 6C 00
65 00 63 00 2E 00 20 00 43 00 6F 00 72 00 70 00 2E 00
```



22	bLength
03	bDescriptor type
0041	A
0053	S
0049	I
0058	X
0020	
0045	E
006C	L
0065	E
0063	C
002E	.
0020	
0043	C
006F	O
0072	R
0070	P
002E	.

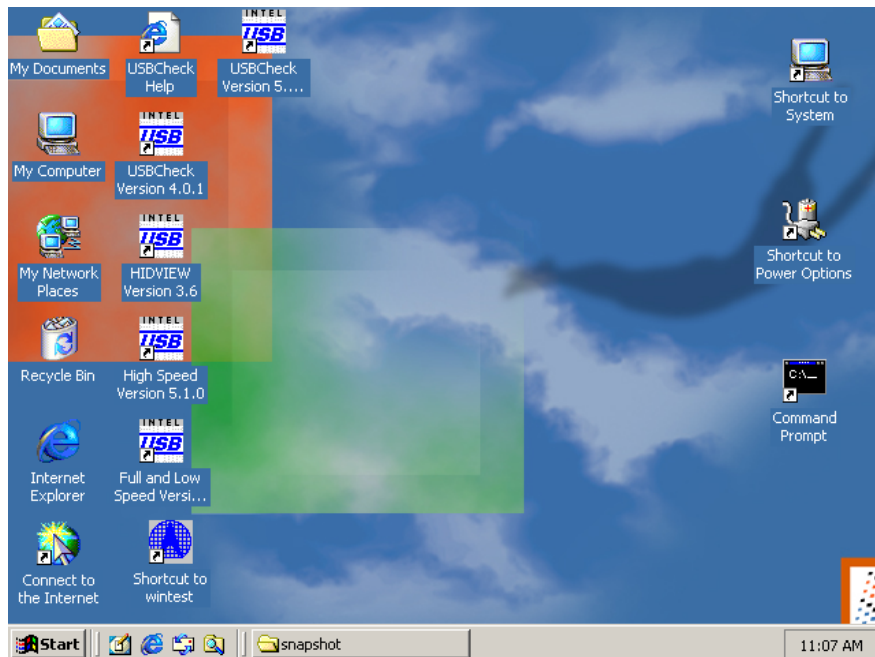
For LAN only, offset 11 is 03 E0

For Combo, offset is 03 01

For Home only, offset 11 is E0 01

Driver installation (WIN2000)

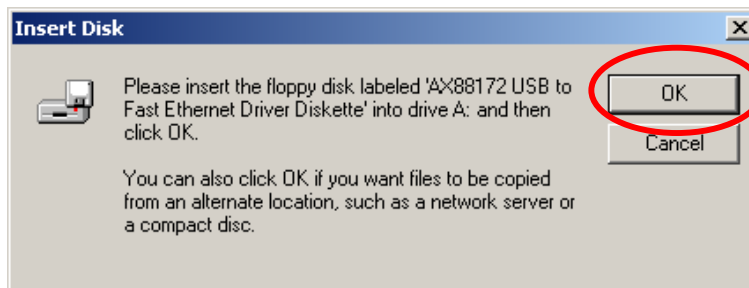
1. Turn your PC on



2. Plug your USB cable to U2E box, WIN2000 P&P will auto detect the system of U2E driver. And PC will found no U2E driver install yet. It will appear following dialog box, click “YES”

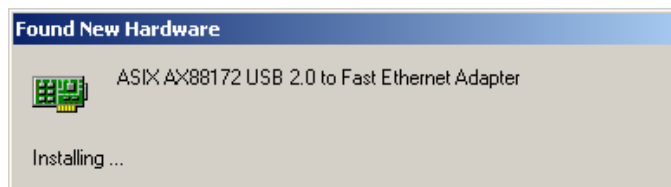


3. Following dialog box appear



Please prepare the AX88172 device driver (Available from ASIX web site)
And please copy it into floppy and click "OK"

4. You will see the the following box to indicat the driver is installing



5 Go to "START→SETTING→CONTROL PANNEL → SYSTEM →Hardware→ Device manager". You should see the driver has installed successful.

